Our New Battleships and T-Boats Lead World's Navies

Vessels of the North Carolina Class When Completed Will Put United States in Advance of Any Nation When Major Fighting Craft Are Considered --- Fleet Submarines Under Construction Completely Overshadow Famous Deutschland in Size and Speed, Besides Possessing Latest Marvels in Mechanical Equipment

HE NEW YORK HERALD publishes herewith another chapter in its series describing the expansion of the United States Navy.

Previous chapters have described the forty knot battle cruiser, to cost \$23,000,000; the mammoth dirigible, R-38, and the remarkable new flying boat, GB-1. THE HERALD recently published a cabled article. from its Berlin correspondent, describing a new German invention by means of which submarines of 10,000 tons and capable of supporting armor may be possible. The announcement of this invention has a direct bearing upon the submarine programmes of the nations. The following article and the accompanying illustration tell just where the United States stands in this respect. The article also makes public the de-

tails of six battleships of the North Carolina class, which are to cost \$22,000,000 each.

New York Herald Bureau, | Washington, D. C., Jan. 29.

now building for the United States Navy, which are the biggest, most improved craft of their kind now actually under construction in the world, are called the T type, probably because a use had been found previously for other letters of the alphabet. Three other fleet submarines now building at the Portsmouth Navy Yard and six for which hids are now under consideration will be known as the V-boats.

Though the new vessels contain many novel features of design, the most striking advance with regard to their construction is their speed and great cruising radius. Nearly 100 feet longer than the best types of German U-boats, they are swift enough to keep up with the main body of the fleet. and their huge oil tanks give them a cruising radius equal to that of the most modern battleship. They have a length of 300 feet. a beam of 27 feet and a tonnage of about 2,000 tons (not official). They will carry 100

In speaking of the "most modern battleship," it may fittingly be said that the United States now has under construction six craft which, when completed, will be superior to any ship of their type affoat. They are the six battleships of the North Carolina class, authorized under the building programme of 1916.

Battleship Still the Fleet's Backbone,

In Opinion of U. S. Naval Experts Though Secretary Daniels and his advisers agree that the submarine proved in the world war that it has a field in naval warfare which can be filled by no other character of ship and are convinced that the American Navy cannot afford to be without an ale-quate number of the most improved types. they still believe that the battleship is the backbone of the fleet.

The battleship North Carolina and her five sister ships will be 684 feet long, 105 feet beam and will have a displacement of 43,200 tons. Her speed will be twenty-three knots an hour and she will have an armament of tweive 16-inch guns and sixteen 6-inch guns. The contract price for the hull and machinery of each of these giant craft

will be in the neighborhood of \$22,000,000.
When these battleships and the six battle cruisers now under construction are com-pleted, as they are expected to be by 1923. the United States, according to Secretary Daniels, will be the first naval Power of the world in respect to major ships and gun power. In total tonnage and effective fightships the United States will be equalled by Great Britain.

The American Navy, however, will be Daniels asserts, in light cruisers and other ships used for protecting the main body of the fleet and in conducting blockoperations. We will be slightly inof the fleet submarines contemplated by the present programme are completed, and the lack of fleet aviation forces will place us 4t disadvantage with Great Britain.

Secretary Daniels Points Out

that while our battleship force will be sufficiently powerful to cope with any navy in the world in a main fleet engagement between battleships, yet our main fleet would be open to torpedo attack by the enemy's torpedo forces. We would also be handi-capped in obtaining information of the nemy's movements and maintaining the handicapped in conducting attacks against the enemy's fleet with torpedoes."

In view of this statement, it is not diffi-cult to understand why naval men are deeply interested in the new fleet submarines.

The following table shows the present strength of the navies of Great Britain and the United States with regard to submarine

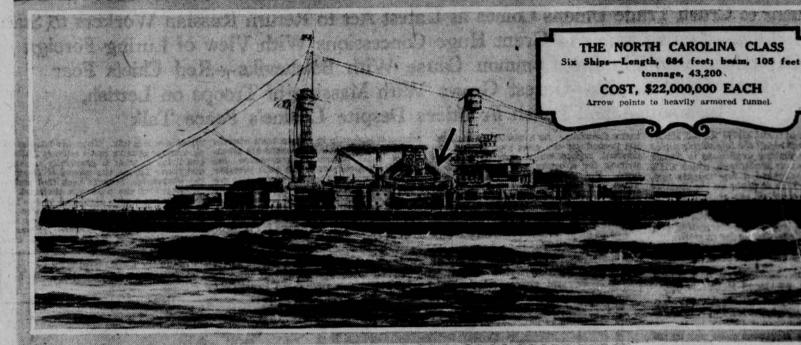
No. of Ships. Tonnage. Great Britain 98 United States..... 54. 35,361 When submarine craft now authorized or projected are completed the table, including

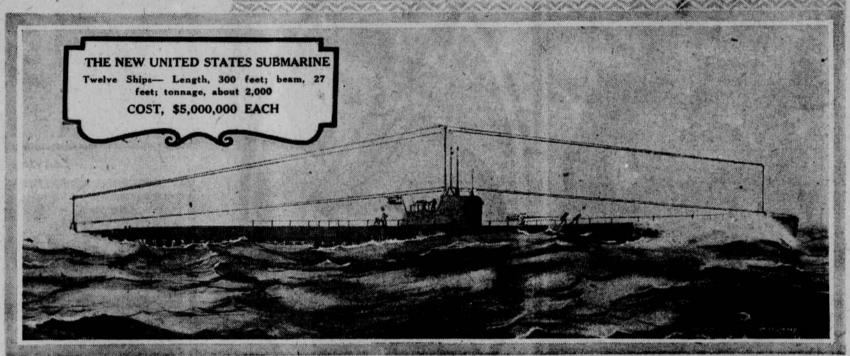
No. of Ships. Tonnage. Great Britain. 117 United States 97 Japan 10

New Craft Several Knots Faster Than the Famous Deutschland

When the Deutschland poked her periscope out of the sea off New London after her epoch making voyage across the Atmazement. Even well informed men found to credit reports of her power and The new fleet submarines, however,

are not only more than one hundred feet





greater displacement than the Deutschland out are also several knots faster.

The present programme contemplates twelve fleet submarines, three to be known as T-boats and nine as V-boats. The first three are being built by the Electric Boat Company of New York and three of the V-boats are being built by the United States Government at the Portsmouth Navy Yard, work having been started on them early in 1920. Last August bids were opened for the remaining six, and these bids are now under consideration. The ships are expected to cot in the neighborhood of \$5,000,000 each. The designs for all the fleet submarines

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eign craft.

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The propelling machinery for surface operations consists of two main Diesel engines, located in the after part of the hull, driving directly on the main shafts, and two auxiliary engines in the forward part of the boat, driving electric generators, which in turn supply electric current to two main motors, one on each main shaft.

When conventing submerged the vessel will

When operating submerged the vessel will be propelled by the two main electric motors, taking current from a powerful storage battery. It is estimated that the surface speed under full power will exceed twenty knots an hour and that nearly half that speed will be attainable in submerged condition. The fuel capacity of the ship is such

as to provide for a radius of action of opproximately 10,000 miles, the vessel being entirely self-supporting during that time. Though an American built the first prac-

Though an American built the first practical submarine and Americans have been foremost in its development, the Diesel engine, which made possible the modern, oceangoing type of submersible, is the invention of a German. The German Navy refused to adopt the submarine so long as there was only gasolene to propel it on the surface. The U-1, forerunner of the long line of U-boats which was the scourge of the seas during the early part of the war, was not during the early part of the war, was not launched until 1906, after Dr. Diesel had got

the gasolene motor are that it gives more power, uses a cheaper grade of fuel and is much less dangerous. Three out of every four strokes of the piston of a gasolene motor waste power instead of producing it, while the Diesel is a two cycle engine, gain-

ing power on every second stroke. ine, which made possible the modern, oceangoing type of submersible, is the invention
of a German. The German Navy refused to
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many gasolene to propel it on the surface.
Three periscopes of the latest improved
pattern will form part of the equipment of
the fleet submarines, and each vessel will
be provided with the latest type of radio
telegraph outfit, both for surface and submerged work. The idea of the periscope
dates from the middle of the nineteenth century, when French and Dutch inventors experimented with them. During the civil
war, when the monitor Osage had run
aground in the Red River, her chief engi-

scope from a piece of three inch steam pipe and bits of looking glass, by means of which the warship's commander was able to look over the high banks of the river and re-

over the high banks of the river and repulse an attack by 3,000 Confederates by fire from the monitor's 11 inch guns, directed through the periscope.

So crude was the periscope, however, that as late as 1900 John P. Holland refused to adopt it for his submarines. To the German through the conditions the adopt it for his submarines. To the Ger-mans belongs the credit for bringing it to its present efficiency. The three periscopes on the new American undersea boats will enable them to keep a lookout in all direc-

enable them to keep a lookout in all directions at once and will also provide "spares" in case one should be damaged.

The first U-boats were equipped with only one periscope, until, after the sinking of the U-15, the Germans began putting more on their vessels. During the early stages of the war the U-15 attacked a British squadron, but revealed herself by the wake of her periscope, and a well aimed shot from the cruiser Birmingham smashed the protruding "eye." The U-15 dived blindly to safety. A few moments later she attempted a quick "porpoise dive" up to the surface and down again in an effort to locate her enemy. This time the Birmingham gavener a broadside and a shell tore a great hole through her deck. through her deck.

Scope of the Submarine's Work

Shows Gain and Is Still Growing Owing to the comparative recency of the development of the oceangoing submarine, particularly of a type of sufficient speed and cruising radius to accompany the fleet, a system of tactics had not yet been completely system of tactics had not yet been completely worked out. The original function of the submarine was to serve as a "daylight torpedo boat;" that is, to accomplish in broad daylight that which surface torpedo boats were expected to do under cover of darkness, fog or smoke, namely, to creep close to an enemy and launch a torpedo unobserved.

With the development of greater speed, armament and range of action, however, the scope of their operations has been broadened.

armament and range of action, nowever, the scope of their operations has been broadened. Owing to their low visibility they are now becoming of utility in night attacks on the surface, though they are useless for underwater attack after nightfall because the periscope is practically blind at night.

The increase in the number of torpede tubes and the greater power of torpedoes carried, together with the larger gun power, has also tended to increase their utility in

engagements with surface ships. The fleet submarines of the United States Navy carry 5-inch guns, which are larger than those ordinarily placed on submarines, though the British navy is said to have a

New Type of Torpedo Tubes

Gives a Distinct Advantage One decided advantage which the new American craft will have is that her sub-merged torpedo tubes are not of the type known as "fixed." This means that when it will not be required to manœuvre the whole craft in order to aim the torpedo tube as is the case with practically all other

Special attention is understood to have been given to the problem of making the new submarines as nearly immune as pos sible to depth bomb explosions. On this subject, however, navy officials are reticent, as the method of attaining this immunity is secret. Thickness of arms, for any officials are reticent. is secret. Thickness of armor, far from protecting the craft from an under water explosion, has just the opposite effect, the armor being driven into the vessel after the manner of a projectile if the explosion is

within close proximity.

Another feature to which American designers have paid particular attention is that of habitability. Careful and detailed study was given all types of foreign vessels during the war, and it may be safely said that the fleet submarines will be more com-fortable for their crews than any other subfortable for their crews than any other sub-marines in the world. The emphasis laid by navy officials upon this point is due to the belief that efficiency of the average sub-marine has in the past been very greatly impaired by living conditions which the av-erage layman would consider unbearable. In this connection it may be stated that the world over American sailors have the repu-tion of being well housed.

Submarines Under Construction

By All the First Class Powers Much has been said in condemnation of Much has been said in condemnation of the submarine, particularly since its em-ployment by Germany in a ruthless subma-rine warfare. It is a significant fact, how-ever, that all first class Powers are building submarines. Secretary Daniels has made clear his attitude in the following statement:

"No nation, if it is to be prepared to en-gage in warfare upon the sea, can afford to neglect the submarine or to spare any pains to develop it to meet its needs. This has come to stay as a factor in naval fare unless outlawed by international agreement. Its abuse by the Germans in their ruthless campaign should not blind us to the fact that there is a large field for its legitimate use. Without accepting the theory of the enthusiasts that submarines alone can be developed to meet adequately all ory of the enthusiasts that submarines alone can be developed to meet adequately all needs of naval warfare, we must all agree that the submarine cannot be ignored and has a field of its own in the conduct of war upon the sea which cannot be filled by any other character of ship."

British Experts Clash Over Types of War

ceed with a giant naval building pro gramme, based on capital ships, the controversy now raging in England over the British naval policy is of intense interest. It instantly raises the question of whether those responsible for the United States proinvolving a total of \$679,515,731, a

tion of whether it is better to build capital are any submarines about." ships, such as dreadnoughts and battle Think Submarines Instead of Battleships ships, such as dreadnoughts and battle Think Submarines Instead of Battleships incredible that the Admiralty will propose cruisers, or smaller craft, like submarines Would Have Won the War for Germany the building of capital ships if serious danand submarine chasers

other nations of the world.

The clash has assumed tremendous proportions, so great, in fact, that the Admi-Weakness of Our Navy Equipment large fighting vesesls has been set aside This means," the Secretary has said, until a complete survey can be accomplished. The investigation is to be conducted, according to the information in Washington, by the British Committee of Imperial Defence.

United States and Japan Going Ahead With Construction of Capital Ships

Mountime the United States and Japan are Meantime the United States and Japan are going ahead on the theory that capital ships, as they always have been, will continue to be the dominating force in naval warfare. Both nations are going ahead with large building programmes, with the result that the British ship played no fear their fleet soon will rank third among of starvation. the navies of the world. It is to retain their "You must pre-war policy of maintaining the most powerful navy afoat that the British are so keenly concerned about the type of vesser vation.
that should be built.

Vice-Admiral Sir Percy Scott, of the Brit-

Vice-Admiral Sir Percy Scott, of the British Navy, the originator of modern naval gunnery, first raised the cry against the battleship when the British Admiralty announced its programme of battleship construction. He based his objections to the Bases Opposition to Capital Ships construction of large fighting craft on the record of the war, in which submarines, not battleships, predominated in the action.

Admiralty ought to explain very clearly what "On investigating this matter the United use it has for the battleships before we build States Navy has an advantage over our own.

Vice-Admiral Sir Percy Scott Holds War Proved Superiority of Submarines---Older Officers Firm for Major Ships

"If we are going to build here part of which is to go for construction are right in their determination of what type of war vessels are required to keep the American Navy in the foreground with the ther nations of the world.

Reep them. For if we do not they will the dispute in England is over the question the surface very long if there

In order to reenforce the arguments against the battleship Sir Percy brought to light an incident of 1913—a blunder, he calls ralty programme for the construction of it—which he believes prevented Germany large fighting vessels has been set aside from winning the war. He recommended in 1913 a British navy programme for the building of submarines and airplanes, instead of two battleships, but the Admiralty overruled. In consequence, he added, Germany built battleships, which were not used, rather than submarines and airplanes, which Germany hastened to construct after the war began. It put Germany behind so much, he said, that she was unable to win the war although she came near to doing it. "You must admit," Sir Percy said, "that in

the war we [England] were nearly forced to submission by at evation. "You must admit that the German battle-

ship played no part in reducing us to a state You must admit that if our battleship superiority had been double what it was

You must admit that the dominant arm

they could not have protected us from star-

On Air Craft as Well as Submarines

"In the war we kept our battleships for based not only on the submarine, but upon four years in port." Sir Percy argued, "and increase, and he defies anybody to cite a vestible Germans kept their battleships for four years in the Kiel canal. When they were taken put they had to be greated." Sir Percy's attack on the capital ship is arguments have attracted much applause among British navy officers who approve

raken out they had to be guarded with whole among British navy officers who approve flotilias of destroyers and treated as if they were made of glass.

"Other Powers may be building battleships. They may also be making a mistake in so doing. That is no business of ours. But if there is a risk that they are mistaken, the tack from the air.

them. It ought to tell us what they are for. Its flying service has not been divorced

of destruction from the air.
"In this country, where aircraft are under separate control, coordinated work may not be so easy or so effective. Navertheless, it is ger from the air is to be apprehended

Older British Navy Officers Stand Firm for the Battleship

The stand against the battleship has attracted innumerable supporters high in the British naval service, but the large surface erritish haval service, but the large surface craft has its defenders, too, in large numbers. In this group are some of the older naval officers, who take the position that the obstacles presented by the submarine have or will be overcome, and that the battleship will remain dominant because of its intense mobility and capability of carrying heavy

The battleship, too, they insist, is the mainstay of the navy when it comes to de-fensive warfare, although it is admitted that

comes to offensive operations.

Admiral Sturdee, of the British Navy, insists that the British must continue the programme of surface craft in order to protect the trade routes. He insists that there never was a time during the war that the never was a time during the war that the Grand Fleet was prevented from going to sea because of the German submarines. He said that if all the nations of the world did away with capital ships and had only sub-marines, the question would get back to where it started. Submarines, he said, would find it im-

where it started.

Submarines, he said, would find it impossible to fight each other and, further, would be of no account in defensive warfare.

The result would be that the merchant vescels would be armed against the submarines.

Then it would be found advisable to have other craft to protect the merchantmen. The result would be submarine destroyers, which would lead to super-destroyers. To meet the super-destroyers, it would be found

Until this war," he says, "the torpedo was

weapon."

Rear Admiral Sir S. Eardiey-Wilmot of the British Navy said that the success of the submarine in the late war was due almost entirely to the fact that nothing had been perfected to resist the torpedo, but he explained that as each new development in naval warfare had come it had been resisted by one means or another. He believed, he added, that the means had been found for resisting submarine attack, and that the battleship still was dominant as a naval unit.

Expects Means Will Be Found To Render Submarines Ineffective

That all of England is concerned over the

That all of England is concerned over the outcome of the controversy is apparent from editorial comments of the London Times and other newspapers, which are devoting columns to the discussion.

"The most important subject now before the country is the question of the naval construction policy of the Admiralty," the London Times said recently. "An invincible navy is the very life of the nation. Yet within a very few years the British fleet, so far as capital ships are concerned, will be far as capital ships are concerned, will be third instead of first among the navies of the world.

the world.

"When all allowance has been made for the fact that the two nations (the United States and Japan) to whom we shall, in this respect, yield pride of piace are our friends, and in all human probability will remain our friends, this is a serious position.

For ourselves, we express no opinion either

take steps to probe the question far more deeply than, to judge from all the available evidence, they have so far thought of doing. For the life of the country is at stake."

Economy in the Government is, of course,

one of the considerations. With capital ships costing from \$30,000,000 to \$40,000,000, the British want to be sure that the vessels they build have some chance of staying affoat in the event of a war. The British Government, after four years of war, is extremely hard pressed for money and rigid saving is a watchword hammered upon continually by Lloyd George and others of the Government in speeches in Parliament. in speeches in Parliament.

In sharp contrast with this policy of cauat the present time. The vessels under con-struction are eleven battleships, six battle meet the super-destroyers, it would be found and the super-destroyers, it would be to have cruisers, which could best cruisers, the second class cruisers, one third be combated by battleships.

T. B. Abell, professor in the School of marines, two gunboats, four tugs and mine Naval Architecture, at the University of sweepers and eleven auxiliaries.

Liverpool, is a stanch defender of the batter of the batt

now the building of eighty-eight more ves-